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cobas® CT/NG v2.0 Test
510(k) Summary

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Contact:	Wilk von Gustedt
Date of Preparation:	July 16, 2013
Device Trade Name:	cobas® CT/NG v2.0 Test
Common Name:	*Chlamydia trachomatis* (CT) and *Neisseria gonorrhoea* (NG) Test
Type of Test:	Nucleic Acid Amplification Test, DNA, *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoea* (NG), qualitative
Classification Names:	Chlamydia serological reagents Neisseria spp. Direct serological test reagents Real Time Nucleic Acid Amplification System
Regulations:	866.3120 866.3390 862.2570
Product codes:	MKZ (DNA Probe, Nucleic Acid Amplification, Chlamydia) LSL (DNA Reagents, Neisseria) OOI: Real Time Nucleic Acid Amplification System
Panel:	Microbiology
Predicate Device-Assay:	cobas® CT/NG Test (K110923)
Predicate Devices-Collection Kits:	**cobas®** PCR Female Swab Sample Kit and the **cobas®** PCR Urine Sample Kit, previously cleared with the **cobas®** CT/NG Test (K110923)

TABLE OF CONTENTS

List of Tables

1. DEVICE DESCRIPTION

The changes between the previously cleared **cobas**® CT/NG Test (K110923) and the currently submitted **cobas**® CT/NG v2.0 Test are limited to the modification of the sample preparation workflow which requires a system software update related to the **cobas**® 4800 system. There are no changes for the reagents or the design between the **cobas**® CT/NG v2.0 Test and the **cobas**® CT/NG Test. The Roche Molecular Systems (RMS) **cobas**® CT/NG v2.0 Test consists of six reagent kits:

- **cobas**® 4800 System Sample Preparation Kit
- **cobas**® 4800 CT/NG v2.0 Amplification/Detection Kit
- **cobas**® 4800 CT/NG Controls Kit
- **cobas**® 4800 System Wash Buffer Kit
- **cobas**® 4800 System Control Diluent Kit
- **cobas**® 4800 System Liquid Cytology Preparation Kit

Sample Collection Kits to be used for the **cobas**® CT/NG v2.0 Test are:

- **cobas**® PCR Female Swab Sample Kit
- **cobas**® PCR Urine Sample Kit
- **PreservCyt® (Hologic, Inc.)**

The **cobas**® CT/NG v2.0 Test for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) is based on two major processes: (1) automated sample preparation to obtain nucleic acids, including CT and NG DNA; (2) simultaneous PCR amplification of target DNA sequences using both CT and NG specific complementary primer pairs and real-time detection of cleaved fluorescent-labeled CT and NG specific oligonucleotide detection probes. Internal control, containing CT and NG DNA, is added to all samples during automated sample preparation and is amplified and detected simultaneously with each sample to monitor the entire process.

The **cobas**® 4800 System utilizes the **cobas x** 480 Instrument for automated sample preparation, and the **cobas z** 480 Analyzer for automated amplification and detection. The **cobas**® 4800 system software integrates the sample preparation with nucleic acid amplification and detection to generate test results.

2. INTENDED USE

The **cobas**® CT/NG v2.0 Test is an automated, in vitro nucleic acid amplification test for the qualitative detection of *Chlamydia trachomatis* (CT) and/or *Neisseria gonorrhoeae* (NG) DNA in urogenital specimens. The Test utilizes the Polymerase Chain Reaction (PCR) for the detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* DNA in male and female urine, self-collected vaginal swab specimens (collected in a clinical setting), clinician-collected vaginal swab specimens, and endocervical swab specimens, all collected in cobas PCR Media (Roche Molecular Systems, Inc.), and cervical specimens collected in PreservCyt® solution. This test is intended as an aid in the diagnosis of chlamydial and gonococcal disease in both symptomatic and asymptomatic individuals.

The **cobas**® PCR Female Swab Sample Kit is used to collect and transport endocervical and vaginal swab specimens. The **cobas**® PCR Media serves as a nucleic acid stabilizing transport and storage medium for gynecological specimens. Use this collection kit only with either the **cobas**® CT/NG Test or the **cobas**® CT/NG v2.0 Test.

The **cobas**® PCR Urine Sample Kit is used to collect and transport urine specimens. The **cobas**® PCR Media serves as a nucleic acid stabilizing transport and storage medium for urine specimens. Use this collection kit only with either the **cobas**® CT/NG Test or the **cobas**® CT/NG v2.0 Test.

3. TECHNOLOGICAL CHARACTERISTICS

The primary technological characteristics and intended use of the RMS **cobas**® CT/NG v2.0 Test are substantially equivalent to other legally marketed nucleic acid amplification tests intended for the qualitative detection of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG).

As indicated in Table 1, the RMS **cobas**® CT/NG v2.0 Test is substantially equivalent to significant characteristics of the identified predicate device, the currently cleared **cobas**® CT/NG Test (K110923).

Table 1: Comparison of the cobas® CT/NG v2.0 Test with the Predicate Device

	Submitted Device: RMS cobas® CT/NG v2.0 Test	**Predicate Device: RMS cobas® CT/NG Test (K110923)**
Intended Use	Qualitative *in vitro* diagnostic test for the direct qualitative detection of *Chlamydia trachomatis* and/or *Neisseria gonorrhoeae* in patient specimens	Same
Sample Types	Male urine Female urine Endocervical swabs Clinician-collected vaginal swabs Patient-collected vaginal swabs Cervical specimens in PreservCyt® Solution	Male urine Patient-collected vaginal swabs
Subject Status	Asymptomatic and symptomatic	Asymptomatic and symptomatic
Sample Collection Devices	Urine collection kit Female swab collection kit	Urine collection kit Female swab collection kit
CT Analyte Targets	CT cryptic plasmid DNA CT *ompA* gene	CT cryptic plasmid DNA CT *ompA* gene
NG Analyte Targets	NG genomic DNA	NG genomic DNA
Sample Preparation Procedure	Semi-automated	Semi-automated
Amplification Technology	Real-time PCR	Real-time PCR
Detection Chemistry	Paired reporter and quencher fluorescence labeled probes (TaqMan Technology) using fluorescence resonance energy transfer (FRET)	Paired reporter and quencher fluorescence labeled probes (TaqMan Technology) using fluorescence resonance energy transfer (FRET)
Result Analysis	Based on PCR cycle threshold analysis	Based on PCR cycle threshold analysis

In summary, the intended use, technology, and functionality of the **cobas**® CT/NG v2.0 Test are substantially equivalent to the predicate device.

4. NON-CLINICAL PERFORMANCE EVALUATION

All performance related testing summarized in this report was performed using the **cobas**® CT/NG v2.0 Test with the exception of the Analytical Specificity study (Section 4.3 below) which is based on the currently cleared **cobas**® CT/NG Test (K110923). The changes between the previously cleared **cobas**® CT/NG Test (K110923) and the currently submitted **cobas**® CT/NG v2.0 Test are limited to the modification of the sample preparation workflow which requires a system software update related to the **cobas**® 4800 system. There are no changes for the reagents or the design between the **cobas**® CT/NG v2.0 Test and the **cobas**® CT/NG Test. Therefore it was concluded that data for the **cobas**® CT/NG Test can also be used to demonstrate performance of the **cobas**® CT/NG v2.0 Test for Analytical Specificity.

4.1. Analytical Sensitivity

The analytical sensitivity (Limit of Detection or LOD) for the **cobas**® CT/NG v2.0 Test was determined by analyzing dilutions of quantified CT and NG cultures. Cultures of CT and NG were diluted into negative urine specimens stabilized in **cobas**® PCR Media, negative endocervical swab specimen in **cobas**® PCR Media, negative vaginal swab specimen in **cobas**® PCR Media, and negative PreservCyt® specimen to determine the LOD for each specimen type. All levels for each specimen type were analyzed using the full **cobas**® CT/NG v2.0 Test workflow with 3 unique lots of **cobas**® CT/NG v2.0 Test reagents. In the course of the study, a total of 5 unique lots of reagents were used. The LOD of the test is defined as the target concentration which can be detected as positive in ≥ 95% of the replicates tested.

The LOD for the CT serovar D and serovar I cultures in urine specimens stabilized in **cobas**® PCR Media, endocervical swab specimen in **cobas**® PCR Media, vaginal swab specimen in **cobas**® PCR Media, and PreservCyt® specimen are shown in Table 2. The LOD for NG strain 2948 (ATCC 19424) and strain 6693 in urine specimens stabilized in **cobas**® PCR Media, endocervical swab specimen in **cobas**® PCR Media, vaginal swab specimen in **cobas**® PCR Media, and negative PreservCyt® specimen are shown in Table 3. When analyzed separately, male and female urine results were statistically equivalent for both CT and NG cultures.

Table 2: cobas® CT/NG v2.0 Test Limit of Detection for CT serovar D and serovar I

Specimen Types	*C. trachomatis serovar D*			*C. trachomatis serovar I*		
	Levels Tested*	Replicates/ Level	LOD (EB/mL)	Levels Tested*	Replicates/ Level**	LOD (EB/mL)
Urine (Female)	6	60	40	6	60	10
Urine (Male)	6	60	40	6	60	20
Endocervical Swabs	6	59-60**	200	6	60	100
Vaginal Swabs	6	60	300	6	60	70
PreservCyt®	6	60	200	6	59-60**	50

* Testing included one negative level with 24-48 replicates

** One replicate was not processed by the **cobas® x** 480 due to insufficient sample volume

Table 3: cobas® CT/NG v2.0 Test Limit of Detection for NG strain 2948 (ATCC 19424) and Strain 6693

Specimen Types	*N. gonorrhoeae strain 2948*			*N. gonorrhoeae strain 6693*		
	Levels Tested*	Replicates/ Level	LOD (CFU/mL)	Levels Tested*	Replicates/ Level**	LOD (CFU/mL)
Urine (Female)	6	60	0.2	7	60	0.4
Urine (Male)	6	60	0.2	7	60	0.6
Endocervical Swabs	6	59-60**	2	6	60	2
Vaginal Swabs	6	60	3	6	60	1.5
PreservCyt®	6	60	1	6	59-60**	1

* Including one negative level with 24-72 replicates

** One replicate was not processed by the **cobas®** x 480 due to insufficient sample volume

4.2. Inclusivity

The sensitivity of the **cobas®** CT/NG v2.0 Test was determined for 13 additional CT serovars, the Swedish variant CT strain (nvCT), and an additional 43 independently isolated strains of NG. Panels were prepared by spiking each CT culture stock into specimen type specific CT/NG negative pools to approximately 0.5 and 1.5 times the LOD of CT serovar D as determined in the LOD studies. Each NG culture was spiked into CT/NG negative pools to approximately 1.5 times the LOD of NG strain 2948 (ATCC 19424) as determined in the LOD studies. At least 20 replicates were tested for each CT and NG level. For any levels that did not produce a 95% or greater hit rate at the levels tested, a higher concentration was prepared and tested.

A total of 13 CT serovars and one nvCT (Swedish variant) strain were evaluated. The minimum concentration from which all of the CT serovars returned a hit rate of ≥ 95% was 60 EB/mL for urine stabilized in cobas PCR Media; 300 EB/mL for endocervical specimen in cobas PCR Media; 150 EB/mL for vaginal specimen in cobas PCR Media; and 100 EB/mL for cervical specimen collected in PreservCyt Solution (Table 4).

A total of 43 strains of NG were evaluated. The minimum concentration from which all of the NG strains returned a hit rate of ≥ 95% was 1 CFU/mL for urine stabilized in cobas PCR Media; 10 CFU/mL for endocervical specimen in cobas PCR Media; 10 CFU/mL for vaginal specimen in cobas PCR Media; and 5 CFU/mL for cervical specimen collected in PreservCyt Solution (Table 5).

Table 4: Summary of CT Serovars/Variant Inclusivity Verification Results

Serovar Type or Variant	Results for *C. trachomatis*							
	Urine		Endocervical Swabs		Vaginal Swabs		PreservCyt®	
	EB/mL	% Hit Rate	EB/mL	% Hit Rate	EB/mL	% Hit Rate	EB/mL	% Hit Rate
A	20	100%	100	100%	150	100%	100	100%
B	20	100%	100	100%	150	100%	100	100%
Ba	20	100%	100	100%	150	100%	100	100%
C	20	100%	100	100%	150	100%	100	100%
E	20	100%	100	100%	150	100%	100	100%
F	20	100%	100	100%	150	100%	100	100%
G	20	100%	100	95%	150	100%	100	100%
H	20	100%	100	95%	150	100%	100	100%
J	20	100%	100	100%	150	100%	100	100%
K	20	100%	100	100%	150	100%	100	100%
LV Type 1	20	100%	100	100%	150	100%	100	100%
LV Type 2	20	100%	100	100%	150	100%	100	100%
LV Type 3	20	100%	100	100%	150	100%	100	100%
nvCT	60	100%	300	100%	150	95%	100	100%

Table 5: Summary of NG Strains Inclusivity Verification Results

Numbers of NG Strains	Urine		Numbers of NG Strains	Endocervical Swabs	
	CFU/mL	% Hit Rate		CFU/mL	% Hit Rate
34	0.3	≥ 95%	39	3	≥ 95%
9	1	100%	4	10	100%
Total = 43			Total = 43		

Numbers of NG Strains	Vaginal Swabs		Numbers of NG Strains	PreservCyt	
	CFU/mL	% Hit Rate		CFU/mL	% Hit Rate
42	4.5	≥ 95%	40	1.5	100%
1	10	100%	3	5	100%
Total = 43			Total = 43		

4.3. Analytical Specificity

A panel of 184 bacteria, fungi and viruses, including those commonly found in the female urogenital tract, as well as representatives of *N. cineria, N. flava, N. lactamica, N. perflava* and *N. subflava* and other phylogenetically unrelated organisms, were tested to assess analytical specificity. The organisms tested are listed in Table 6. All organisms were tested at concentrations of at least 1 x 10^6 Units*/mL except those organisms listed in Table 7. All organisms were spiked into CT/NG negative **cobas**® PCR Media, pooled negative urine stabilized in **cobas**® PCR Media, pooled negative vaginal specimen in **cobas**® PCR Media, and pooled negative PreservCyt® specimen spiked with CT and NG cultures at 3 times the limit of detection. Results indicated that none of these organisms interfered with detection of CT and NG or produced a false positive result in the CT/NG negative matrices.

** All bacteria were quantified as Colony Forming Units (CFU) except Chlamydophila pneumoniae as Inclusion Forming Units (IFU). Treponema pallidum and HBV were quantified as DNA copies. Adenovirus was quantified as Plaque Forming Units (PFU). CMV, EBV, HSV-1 and HSV-2 were quantified as Viral Particles (VP). HCV and HIV-1 were quantified in International Units (IU). Trichomonas vaginalis, HPV16 and HPV18 were quantified as cells/mL.*

Table 6: Microorganisms Tested for Analytical Specificity

Achromobacter xerosis	*Helicobacter pylori*	*Neisseria sicca*
Acinetobacter calcoaceticus	Hepatitis B virus (HBV)	*Neisseria subflava*
Acinetobacter lwoffi	Hepatitis C virus (HCV)	*Neisseria subflava 6458*
Acinetobacter sp. genospecies 3	Human immunodeficiency virus	*Neisseria subflava 6617*
Actinomyces israelii	Human papillomavirus type 16 (CaSki cells)	*Neisseria subflava 6618*
Actinomyces pyogenes	Human papillomavirus type 18 (HeLa cells)	*Neisseria subflava 7441*
Adenovirus	Herpes Simplex Virus (HSV-1)	*Neisseria subflava 7452*
Aerococcus viridans	Herpes Simplex Virus (HSV-2)	*Neisseria weaverii*
Aeromonas hydrophila	*Kingella dentrificans*	*Pantoea agglomerans*
Alcaligenes faecalis	*Kingella kingae*	*Paracoccus denitrificans*
Bacillus subtilis	*Klebsiella oxytoca*	*Pasteurella maltocida*
Bacillus thuringiensis	*Klebsiella pneumoniae ss ozaenae*	*Pediococcus acidilactica*
Bacteroides caccae	*Lactobacillus acidophillus*	*Peptostreptococcus anaerobius*
Bacteroides fragilis	*Lactobacillus brevis*	*Peptostreptococcus asacharolyticus*
Bacteroides ureolyticus	*Lactobacillus crispatus*	*Peptostreptococcus magnus*
Bifidobacterium adolescentis	*Lactobacillus delbrueckii subsp. lactis*	*Plesiomonas shigelloides*
Bifidobacterium breve	*Lactobacillus jensenii*	*Prevotella bivia*
Bifidobacterium longum	*Lactobacillus lactis lactis*	*Prevotella corporis*
Branhamella catarrhalis	*Lactobacillus oris*	*Prevotella intermedia*
Brevibacterium linens	*Lactobacillus parabuchneri*	*Propionibacterium acnes*
Campylobacter gracilis	*Lactobacillus vaginalis*	*Proteus mirabilis*
Campylobacter jejuni	*Lactococcus lactis cremoris*	*Proteus vulgaris*
Candida albicans	*Legionella bozemnii*	*Providencia stuartii*
Candida glabrata	*Legionella pneumophila*	*Pseudomonas aeruginosa*
Candida guilliermondi	*Listeria monocytogenes*	*Pseudomonas fluorescens*
Candida krusei	*Micrococcus luteus*	*Pseudomonas putida*
Candida parapsilosis	*Mobiluncus curtisii subsp. curtisii*	*Rahnella aquatilis*
Candida tropicalis	*Mobiluncus curtisii subsp. holmesii*	*Rhizobium radiobacter*
Chlamydophila pneumoniae	*Mobiluncus mulieris*	*Rhodospirillum rubrum*
Chromobacter violaceum	*Moraxella catarrhalis*	*Ruminococcus productus*
Chryseobacterium meningosepticum	*Moraxella lacunata*	*Saccharomyces cerevisiae*
Citrobacter braakii	*Moraxella osloensis*	*Salmonella choleraesuis*
Citrobacter freundii	*Morganella morganii*	*Salmonella minnesota*
Clostridium innocuum	*Mycobacterium avium*	*Salmonella typhimurium*
Clostridium perfringens	*Mycobacterium gordonae*	*Serratia denitrificans*
Clostridium sporogenes	*Mycobacterium smegmatis*	*Serratia marcescens*
Corynebacterium genitalium	*Mycoplasma genitalium*	*Staphylococcus aureus*
Corynebacterium renale	*Mycoplasma hominis*	*Staphylococcus epidermidis*

Corynebacterium xerosis	*Mycoplasma pneumoniae*	*Staphylococcus saprophyticus*
Cryptococcus neoformans	*Neisseria cinerea 832*	*Streptococcus agalactiae*
Cytomegalovirus	*Neisseria cinerea 3306*	*Streptococcus anginosus*
Deinococcus radiodurans	*Neisseria cinerea 3307*	*Streptococcus bovis*
Deinococcus radiopugnans	*Neisseria cinerea 3308*	*Streptococcus dysgalactiae*
Derxia gummosa	*Neisseria cinerea 6317*	*Streptococcus equinis*
Edwardsiella tarda	*Neisseria dentrificans*	*Streptococcus mitis*
Eikenella corrodens	*Neisseria elongata subsp. niroreducans*	*Streptococcus mutans*
Enterobacter aerogenes	*Neisseria flava*	*Streptococcus pneumoniae*
Enterobacter cloacae	*Neisseria flavescens*	*Streptococcus pyogenes*
Enterococcus avium	*Neisseria kochi*	*Streptococcus salivarius*
Enterococcus faecalis	*Neisseria lactamica*	*Streptococcus sanguis*
Enterococcus faecium	*Neisseria meningitidis 135*	*Streptomyces griseinus*
Epstein Barr Virus	*Neisseria meningitidis Serogroup A*	*Treponema pallidum*
Erwinia herbicola	*Neisseria meningitidis Serogroup B*	*Trichomonas vaginalis*
Erysipelothrix rhusiopathiae	*Neisseria meningitidis Serogroup C*	*Ureaplasma urealyticum*
Escherichia coli	*Neisseria meningitidis Serogroup D*	*Veillonela parvula*
Ewingella americana	*Neisseria meningitidesSerogroup Y*	*Vibrio parahaemolyticus*
Flavobacterium meningosepticum	*Neisseria mucosa*	*Weissella paramesenteroides*
Fusobacterium nucleatum	*Neisseria perflava 837*	*Yersinia enterocolitica*
Gardnerella vaginalis	*Neisseria perflava 911*	
Gemella haemolysans	*Neisseria perflava 6339*	
Gemella morbillorum	*Neisseria perflava 6340*	
Haemophilus ducreyi	*Neisseria perflava 6341*	
Haemophilus influenzae	*Neisseria polysaccharea*	

Table 7: List of Microorganisms Tested below 1 x 10^6 Units/mL for Analytical Specificity

Microorganism Tested	Concentration Tested in Listed Matrix*			
	cobas® PCR Media	Negative Urine Specimen	Negative Vaginal Specimen	Negative PreservCyt Specimen
Adenovirus		$8x10^5$ PFU/mL	$8x10^5$ PFU/mL	$8x10^5$ PFU/mL
Cytomegalovirus (CMV)	$1x10^4$ VP/mL			
Chlamydophila pneumoniae	$1x10^5$ IFU/mL	$1.1x10^4$ IFU/mL	$1.1x10^4$ IFU/mL	$1.1x10^4$ IFU/mL
Gemella morbillorum		4.5×10^4 CFU/mL	4.5×10^4 CFU/mL	4.5×10^4 CFU/mL
Hepatitis C virus (HCV)		5.6×10^4 IU/mL	5.6×10^4 IU/mL	5.6×10^4 IU/mL
Human papillomavirus (HPV) type 16 (SiHa cells)		$1x10^4$ cells/mL	$1x10^4$ cells/mL	$1x10^4$ cells/mL
Human papillomavirus (HPV) type 18 (HeLa cells)		$1x10^4$ cells/mL	$1x10^4$ cells/mL	$1x10^4$ cells/mL
Neisseria cinerea 3307			$4x10^5$ CFU/mL	$4x10^5$ CFU/mL
Prevotella bivia		$9x10^4$ CFU/mL	$9x10^4$ CFU/mL	$9x10^4$ CFU/mL
Prevotella corporis			$1.4x10^5$ CFU/mL	$1.4x10^5$ CFU/mL
Treponema pallidum	Not Tested	$1x10^5$ copies/mL	$1x10^5$ copies/mL	$1x10^5$ copies/mL
Trichomonas vaginalis			$6.5x10^5$ cells/mL	$6.5x10^5$ cells/mL

*Gray cells indicate concentration tested was ≥ 1 x 10^6 Units/mL in that matrix

4.4. Interference

Interference testing was performed using CT/NG negative urine specimen stabilized in **cobas**® PCR Media, endocervical swab specimen in **cobas**® PCR Media, vaginal swab specimen in **cobas**® PCR Media, and PreservCyt® specimen spiked with CT and NG cultures at ~ 3 x LOD for each target. Twenty-three over-the-counter (OTC) products and prescription medications, as well as whole blood, and PBMC cells were tested for interference. Additionally, cervical mucus was tested in swabs samples, and albumin, bilirubin, glucose, and pH were tested for interference in the urine specimen type.

Of the 23 products tested, Metronidazole Vaginal Gel and Vagisil Satin produced invalid and/or false negative results in the urine panel samples. Replens® vaginal moisturizer produced invalid and/or false negative results in urine and endocervical swab panel samples. No interference from any of the other products was observed with the other sample matrices tested.

The levels of albumin, bilirubin, glucose, and pH shown in Table 8 and the levels of whole blood, mucus and PBMC cells shown in Table 9 represent maximum allowable concentrations which will not interfere with the **cobas**® CT/NG v2.0 Test performance.

Table 8: Results from Endogenous Interference Testing for Albumin, Bilirubin, Glucose, and pH

Specimen Type	Albumin (w/v)		Bilirubin (w/v)		Glucose		pH	
	Concentration Tested	Interference Observed	Concentration Tested	Interference Observed	Concentration Tested	Interference Observed	Concentration Tested	Interference Observed
Urine	0%, 1%, 2%, 5%	None	0%,0.05%, 0.10%, 0.25%,0.50%	None	0%, 0.5%, 1%	None	Acidic (pH4), Alkaline (pH9)	None

Table 9: Results from Endogenous Interference Testing for Whole Blood, PBMC, and Mucus

Specimen Type	Whole Blood (v/v)		PBMC (cells/mL)		Mucus	
	Concentration Tested	Interference Observed	Concentration Tested	Interference Observed	Concentration Tested	Interference Observed
Urine	0%, 0.10%, 0.25%, 0.50%, 1%	> 0.25%	0, 1.0+E05, 1.0+E06, 1.0+E07	> 1.0+E05	Not Tested	Not Tested
Endocervical Swab	0%, 3%, 5%, 10%	None	0, 1.0+E05, 1.0+E06, 1.0+E07	> 1.0+E06	Routine Level *	None
Vaginal Swab	0%, 3%, 5%, 10%	None	0, 1.0+E05, 1.0+E06, 1.0+E07	> 1.0+E06	Routine Level *	None
Cervical PreservCyt	0%, 3%, 5%, 10%	> 3%	0, 1.0+E05, 1.0+E06, 1.0+E07	None	Routine Level *	None

*Routine Level = Quantity of cervical mucus equivalent to amount normally removed prior to sampling

4.5. Precision

Precision of the **cobas**® CT/NG v2.0 Test was examined in-house using a test panel composed of CT and NG cultures diluted into pools of CT and NG negative urine specimen stabilized in **cobas**® PCR Media, vaginal swab specimen in **cobas**® PCR Media, and PreservCyt® specimen. The precision panel was designed to include negative samples as well as samples with CT and/or NG concentrations at and above the LOD of the **cobas**® CT/NG v2.0 Test. Additionally, samples with high CT or NG titers were examined for suppression of low titer target in the adjacent channel. Testing was done with three unique lots of **cobas**® CT/NG v2.0 Test reagents, three instruments, over 12 days. A description of the precision panels is shown in Table 10 and the study performance in % hit rates is shown in Table 11. All positive panel levels yielded the anticipated hit rates, with the exception of panel member 3 in urine which resulted in a hit rate of 83%. All negative panel levels tested negative throughout the study.

Table 10: Panel Design for In-House Precision Study

Panel Member	CT		NG	
	Level	Anticipated Hit Rate (%)	Level	Anticipated Hit Rate (%)
1	Negative	0	Negative	0
2	Negative	0	High Negative	20-80
3	High Negative	20-80	Negative	0
4	Low Positive	≥ 90	Low Positive	≥ 90
5	Moderate Positive	≥ 99	Low Positive	≥ 90
6	Low Positive	≥ 90	Moderate Positive	≥ 99
7	Low Positive	≥ 90	High Positive	≥ 99
8	High Positive	≥ 99	Low Positive	≥ 90
9	High Positive	≥ 99	High Positive	≥ 99

Table 11: In-House Precision Study Hit Rate Analysis

Panel Matrix	Target	CT					NG				
	Panel Member	Mean	Positive	Valid	% Hit Rate	95% CI	Mean	Positive	Valid	% Hit Rate	95% CI
Urine stabilized in cobas® PCR Media	1	N/A	0	48	0	0 - 7.4%	N/A	0	48	0	0 - 7.4%
	2	N/A	0	48	0	0 - 7.4%	36.9	32	48	67	51.6 - 79.6%
	3	37.9	40	48	83	69.8 - 92.5%	N/A	0	48	0	0 - 7.4%
	4	35.5	48	48	100	92.6 - 100%	36.2	48	48	100	92.6 - 100%
	5	34.6	48	48	100	92.6 - 100%	36.1	48	48	100	92.6 - 100%
	6	35.4	48	48	100	92.6 - 100%	35.1	48	48	100	92.6 - 100%
	7	36.1	48	48	100	92.6 - 100%	18.4	48	48	100	92.6 - 100%
	8	18.0	48	48	100	92.6 - 100%	36.7	48	48	100	92.6 - 100%
	9	18.3	48	48	100	92.6 - 100%	18.0	48	48	100	92.6 - 100%
Vaginal swab in cobas® PCR Media	1	N/A	0	48	0	0 - 7.4%	N/A	0	48	0	0 - 7.4%
	2	N/A	0	48	0	0 - 7.4%	37.6	29	48	60	45.3 - 74.2%
	3	36.9	22	48	46	31.4 - 60.8%	N/A	0	48	0	0 - 7.4%
	4	36.5	48	48	100	92.6 - 100%	37.1	48	48	100	92.6 - 100%
	5	35.8	48	48	100	92.6 - 100%	37.2	48	48	100	92.6 - 100%
	6	36.7	47	48	98	88.9 - 99.9%	36.5	48	48	100	92.6 - 100%
	7	36.6	47	48	98	88.9 - 99.9%	18.6	48	48	100	92.6 - 100%
	8	21.6	48	48	100	92.6 - 100%	36.8	48	48	100	92.6 - 100%
	9	21.2	48	48	100	92.6 - 100%	18.1	48	48	100	92.6 - 100%

Panel Matrix	Target	CT					NG				
	Panel Member	Mean	Positive	Valid	% Hit Rate	95% CI	Mean	Positive	Valid	% Hit Rate	95% CI
PreservCyt®	1	N/A	0	47	0	0 - 7.5%	N/A	0	47	0	0 - 7.5%
	2	N/A	0	47	0	0 - 7.5%	36.0	26	47	55	40.1 - 69.8%
	3	36.4	26	47	55	40.1 - 69.8%	N/A	0	47	0	0 - 7.5%
	4	35.0	48	48	100	92.6 - 100%	34.7	47	48	98	88.9 - 99.9%
	5	33.7	47	47	100	92.5 - 100%	34.8	47	47	100	92.5 - 100%
	6	34.7	48	48	100	92.6 - 100%	33.5	48	48	100	92.6 - 100%
	7	34.8	48	48	100	92.6 - 100%	18.9	48	48	100	92.6 - 100%
	8	18.9	48	48	100	92.6 - 100%	34.3	48	48	100	92.6 - 100%
	9	18.8	48	48	100	92.6 - 100%	17.7	48	48	100	92.6 - 100%

5. CLINICAL PERFORMANCE

The clinical performance characteristics of the **cobas®** CT/NG v2.0 Test were established in three multi-center clinical investigations conducted in the United States. One study evaluated the reproducibility at one internal and two external testing sites and two studies evaluated the sensitivity, specificity, and predictive values of the **cobas®** CT/NG v2.0 Test on clinical specimens tested at 7 external testing sites.

One clinical investigation used archived endocervical specimens, self-collected and clinician collected vaginal specimens, endocervical specimens in PreservCyt Solution and male and female urine specimens, from symptomatic and asymptomatic males and females, collected during the clinical evaluation of the **cobas®** CT/NG Test (archived samples). A second investigation was performed using prospectively collected endocervical specimens, clinician-collected vaginal specimens, female urine specimens, and cervical specimens in PreservCyt Solution from asymptomatic women (prospective fresh samples). Specimen collection for these studies took place at 18 collection sites in the US, which included family planning and Obstetrics/Gynecology (OB/GYN) clinics, and sexually transmitted disease clinics.

5.1. Reproducibility

A Reproducibility Study was performed across, testing site, operator, run, and day for the **cobas®** CT/NG v2.0 Test for detection of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoeae* (NG) using 3 panels prepared from negative vaginal swabs collected in **cobas®** PCR Media, negative urine stabilized in **cobas®** PCR Media and negative cervical specimens collected in PreservCyt® Solution. The 5 panel members for each matrix type contained single target levels of CT and NG at 1 x LOD and 3 x LOD plus one CT/NG negative level. Testing was performed at two external sites and one in-house site. A run for **cobas®** PCR Media (urine and swab) included 3 replicates of each of 5 panel members and 1 positive and 1 negative control (32 total tests). A run for the PreservCyt® Solution panel included 3 replicates of each of 5 panel members and 1 positive and 1 negative control (17 total tests). The 2 operators at each site performed 1 run per day each, for a total of 5 days of testing per operator per panel type (10 days of testing total for each panel type). Testing was performed with 1 reagent lot.

Overall, 127 runs were performed; 62 were for urine and swab panels (which were run together) and 65 were for PreservCyt panels. Sixty valid runs were obtained for each media type. Two failed runs occurred for the urine and swab panels, and 5 failed runs occurred for the PreservCyt panels. Failed runs were attributed to protocol deviations and instrument errors. A total of 900 tests were performed on the 5 panel members for each panel type. There was 1 invalid test result in the PreservCyt panel type, and 1 failed test result each in the swab, urine and PreservCyt panels. These failed tests were due to instrument errors.

All valid test results were included in the analyses of the percent agreement for CT and NG for each panel type separately. There were no false positive results for either analyte (CT and NG) for all panel types for negative panel members, thus giving negative percent agreement (NPA) of 100% for each analyte.

5.1.1. *C. trachomatis* (Table 12, Table 13, Table 14, and Table 15)

Table 12 below presents the total standard deviation (SD) and total percent coefficient of variation (CV [%]) for each panel type, respectively. Across all panel types, the total CV (%) ranged from 1.4% to 2.6%.

Percent agreement for the CT-positive panel members was 100% for 3 X LOD CT of all 3 panel types and also for the 1 X LOD CT of urine panel type. For the remaining 1 X LOD CT, percent agreement was 96.7% for swab and 98.9% for PreservCyt panel types. (Table 13 through Table 15.)

Table 12: *C. trachomatis:* Overall Mean, Standard Deviations, and Coefficients of Variation (%) for Cycle Threshold, Estimated From Valid Samples of Positive Sample Type Panel Members

			Standard Deviation [SD] and Percent Coefficient of Variation [CV(%)]											
			Within-Run		Between-Run		Between-Day		Between-Operator		Between-Site/ Instrument		Total	
Panel Member	n[1]/ N	Mean Ct	SD	CV%	SD	CV%	SD	CV%	SD	CV%	SD	CV%	SD	CV%
PCR Media/Urine														
1 X LOD CT, Negative NG	180/ 180	37.11	0.54	1.5%	0.00	0.0%	0.23	0.6%	0.13	0.4%	0.22	0.6%	0.64	1.7%
3 X LOD CT, Negative NG	180/ 180	35.77	0.38	1.1%	0.18	0.5%	0.15	0.4%	0.00	0.0%	0.21	0.6%	0.50	1.4%
PCR Media/Swab														
1 X LOD CT, Negative NG	174/ 180	36.99	0.82	2.2%	0.17	0.5%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.84	2.3%
3 X LOD CT, Negative NG	180/ 180	36.11	0.42	1.2%	0.24	0.7%	0.14	0.4%	0.14	0.4%	0.00	0.0%	0.53	1.5%
PreservCyt Solution														
1 X LOD CT, Negative NG	177/ 179	35.21	0.88	2.5%	0.00	0.0%	0.28	0.8%	0.00	0.0%	0.00	0.0%	0.93	2.6%
3 X LOD CT, Negative NG	180/ 180	33.81	0.68	2.0%	0.03	0.1%	0.18	0.5%	0.15	0.4%	0.00	0.0%	0.72	2.1%

[1] n is the number of positive tests, which contribute Ct values to the analysis. N is the total number of valid tests for the panel member.

Table 13: *C. trachomatis*: Percent Agreement by Panel Member Overall and for Site/Instrument, Operator, and Day - PCR Media/Urine

Panel Member	Ct SD	Ct CV %	Percent Agreement*										
			Overall		Site / Instrument			Operator			Day		
1 X LOD CT, Negative NG	0.64	1.7	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
3 X LOD CT, Negative NG	0.50	1.4	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 1 X LOD NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 3 X LOD NG	n/a	n/a	100.0	179/179	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	59/59	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	35/35
								4	100.0	29/29	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			

* For negative samples, percent agreement = (number of negative results/total valid results) x 100; for positive samples, percent agreement = (number of positive results/total valid results) x 100.

Ct = cycle threshold; SD = standard deviation; CV = coefficient of variation; LOD = limit of detection; n/a = not applicable; CT = *C. trachomatis*; NG = *N. gonorrhoeae*; n/a = not applicable.

Table 14: *C. trachomatis*: Percent Agreement by Panel Member Overall and for Site/Instrument, Operator, and Day - PCR Media/Swab

Panel Member	Ct SD	Ct CV %	Percent Agreement *										
			Overall		Site / Instrument			Operator			Day		
1 X LOD CT, Negative NG	0.84	2.3	96.7	174/180	1	98.3	59/60	1	96.7	29/30	1	100.0	36/36
					2	95.0	57/60	2	100.0	30/30	2	97.2	35/36
					3	96.7	58/60	3	96.7	29/30	3	97.2	35/36
								4	93.3	28/30	4	94.4	34/36
								5	96.7	29/30	5	94.4	34/36
								6	96.7	29/30			
3 X LOD CT, Negative NG	0.53	1.5	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 1 X LOD NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 3 X LOD NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, Negative NG	n/a	n/a	99.4	178/179	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	59/59	2	100.0	30/30	2	100.0	35/35
					3	98.3	59/60	3	100.0	29/29	3	97.2	35/36
								4	100.0	30/30	4	100.0	36/36
								5	96.7	29/30	5	100.0	36/36
								6	100.0	30/30			

* For negative samples, percent agreement = (number of negative results/total valid results) x 100;
for positive samples, percent agreement = (number of positive results/total valid results) x 100.

Ct = cycle threshold; SD = standard deviation; CV = coefficient of variation; LOD = limit of detection; n/a = not applicable; CT = *C. trachomatis*; NG = *N. gonorrhoeae*; n/a = not applicable.

Table 15: *C. trachomatis*: Percent Agreement by Panel Member Overall and for Site/Instrument, Operator, and Day - PreservCyt

Panel Member	Ct SD	Ct CV %	Percent Agreement *										
			Overall		Site / Instrument			Operator			Day		
1 X LOD CT, Negative NG	0.93	2.6	98.9	177/179	1	98.3	59/60	1	96.7	29/30	1	100.0	36/36
					2	98.3	58/59	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	96.7	29/30	3	97.2	35/36
								4	100.0	29/29	4	100.0	35/35
								5	100.0	30/30	5	97.2	35/36
								6	100.0	30/30			
3 X LOD CT, Negative NG	0.72	2.1	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 1 X LOD NG	n/a	n/a	100.0	179/179	1	100.0	60/60	1	100.0	30/30	1	100.0	35/35
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	59/59	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	29/29	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 3 X LOD NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			

* For negative samples, percent agreement = (number of negative results/total valid results) x 100; for positive samples, percent agreement = (number of positive results/total valid results) x 100.

Ct = cycle threshold; SD = standard deviation; CV = coefficient of variation; LOD = limit of detection; CT = *C. trachomatis*; NG = *N. gonorrhoeae*; n/a = not applicable.

5.1.2. *N. gonorrhoeae* (Table 16, Table 17, Table 18, Table 19)

Table 16 below presents the total standard deviation (SD) and total percent coefficient of variation (CV [%]) for each panel type, respectively. Across all panel types, the total CV (%) ranged from 1.6% to 2.6%.

Percent agreement for the NG positive panel members was 99.4% for the 3 X LOD NG urine panel and 100% for the 3 X LOD NG swab and PreservCyt panel types.) For the 1 X LOD NG, percent agreement was 95% for the urine panel type, 89.4% for the swab panel type and 99.4% for the PreservCyt panel type (Table 17 through Table 19).

There were no false positive results for NG negative panel members across all 3 panel types, thus yielding an analytical specificity of 100% for each panel type.

Table 16: *N. gonorrhoeae*: Overall Mean, Standard Deviations, and Coefficients of Variation (%) for Cycle Threshold, Estimated From Valid Samples of Positive Sample Type Panel Members

			Standard Deviation [SD] and Percent Coefficient of Variation [CV(%)]											
			Within-Run		Between-Run		Between-Day		Between-Operator		Between-Site/ Instrument		Total	
Panel Member	n[1]/ N	Mean Ct	SD	CV%	SD	CV%	SD	CV%	SD	CV%	SD	CV%	SD	CV%
PCR Media/Urine														
Negative CT, 1 X LOD NG	171/ 180	38.00	0.58	1.5%	0.26	0.7%	0.00	0.0%	0.17	0.5%	0.16	0.4%	0.67	1.8%
Negative CT, 3 X LOD NG	178/ 179	36.93	0.52	1.4%	0.18	0.5%	0.17	0.5%	0.02	0.1%	0.26	0.7%	0.63	1.7%
PCR Media/Swab														
Negative CT, 1 X LOD NG	161/ 180	37.97	0.58	1.5%	0.24	0.6%	0.05	0.1%	0.27	0.7%	0.00	0.0%	0.68	1.8%
Negative CT, 3 X LOD NG	180/ 180	37.31	0.56	1.5%	0.12	0.3%	0.00	0.0%	0.08	0.2%	0.15	0.4%	0.60	1.6%
PreservCyt Solution														
Negative CT, 1 X LOD NG	178/ 179	35.22	0.92	2.6%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.92	2.6%
Negative CT, 3 X LOD NG	180/ 180	33.72	0.70	2.1%	0.19	0.6%	0.00	0.0%	0.21	0.6%	0.10	0.3%	0.76	2.3%

[1] n is the number of positive tests, which contribute Ct values to the analysis. N is the total number of valid tests for the panel member.

Table 17: *N. gonorrhoeae*: Percent Agreement by Panel Member Overall and for Site/Instrument, Operator, and Day - PCR Media/Urine

Panel Member	Ct SD	Ct CV %	Percent Agreement *										
			Overall		Site / Instrument			Operator			Day		
1 X LOD CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
3 X LOD CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 1 X LOD NG	0.67	1.8	95.0	171/180	1	96.7	58/60	1	96.7	29/30	1	91.7	33/36
					2	96.7	58/60	2	96.7	29/30	2	94.4	34/36
					3	91.7	55/60	3	96.7	29/30	3	100.0	36/36
								4	96.7	29/30	4	91.7	33/36
								5	96.7	29/30	5	97.2	35/36
								6	86.7	26/30			
Negative CT, 3 X LOD NG	0.63	1.7	99.4	178/179	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	59/59	2	100.0	30/30	2	100.0	36/36
					3	98.3	59/60	3	100.0	30/30	3	100.0	35/35
								4	100.0	29/29	4	100.0	36/36
								5	100.0	30/30	5	97.2	35/36
								6	96.7	29/30			
Negative CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			

* For negative samples, percent agreement = (number of negative results/total valid results) x 100; for positive samples, percent agreement = (number of positive results/total valid results) x 100.

Ct = cycle threshold; SD = standard deviation; CV = coefficient of variation; LOD = limit of detection; CT = *C. trachomatis*; NG = *N. gonorrhoeae*; n/a = not applicable.

Table 18: *N. gonorrhoeae*: Percent Agreement by Panel Member Overall and for Site/Instrument, Operator, and Day - PCR Media/Swab

Panel Member	Ct SD	Ct CV %	Percent Agreement*										
			Overall		Site / Instrument			Operator			Day		
1 X LOD CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
3 X LOD CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 1 X LOD NG	0.68	1.8	89.4	161/180	1	91.7	55/60	1	93.3	28/30	1	91.7	33/36
					2	85.0	51/60	2	90.0	27/30	2	94.4	34/36
					3	91.7	55/60	3	73.3	22/30	3	88.9	32/36
								4	96.7	29/30	4	86.1	31/36
								5	93.3	28/30	5	86.1	31/36
								6	90.0	27/30			
Negative CT, 3 X LOD NG	0.60	1.6	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, Negative NG	n/a	n/a	100.0	179/179	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	59/59	2	100.0	30/30	2	100.0	35/35
					3	100.0	60/60	3	100.0	29/29	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			

* For negative samples, percent agreement = (number of negative results/total valid results) x 100; for positive samples, percent agreement = (number of positive results/total valid results) x 100.
Ct = cycle threshold; SD = standard deviation; CV = coefficient of variation; LOD = limit of detection;
CT = *C. trachomatis*; NG = *N. gonorrhoeae*; n/a = not applicable.

Table 19: *N. gonorrhoeae*: Percent Agreement by Panel Member Overall and for Site/Instrument, Operator, and Day - PreservCyt

Panel Member	Ct SD	Ct CV %	Percent Agreement *										
			Overall		Site / Instrument			Operator			Day		
1 X LOD CT, Negative NG	n/a	n/a	100.0	179/179	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	59/59	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	29/29	4	100.0	35/35
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
3 X LOD CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 1 X LOD NG	0.92	2.6	99.4	178/179	1	100.0	60/60	1	100.0	30/30	1	100.0	35/35
					2	98.3	59/60	2	100.0	30/30	2	97.2	35/36
					3	100.0	59/59	3	96.7	29/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	29/29	5	100.0	36/36
								6	100.0	30/30			
Negative CT, 3 X LOD NG	0.76	2.3	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			
Negative CT, Negative NG	n/a	n/a	100.0	180/180	1	100.0	60/60	1	100.0	30/30	1	100.0	36/36
					2	100.0	60/60	2	100.0	30/30	2	100.0	36/36
					3	100.0	60/60	3	100.0	30/30	3	100.0	36/36
								4	100.0	30/30	4	100.0	36/36
								5	100.0	30/30	5	100.0	36/36
								6	100.0	30/30			

* For negative samples, percent agreement = (number of negative results/total valid results) x 100;
for positive samples, percent agreement = (number of positive results/total valid results) x 100.
Ct = cycle threshold; SD = standard deviation; CV = coefficient of variation; LOD = limit of detection; CT = *C. trachomatis*; NG = *N. gonorrhoeae*; n/a = not applicable.

5.2. Clinical Specimen Study

5.2.1. Study Design

The clinical performance characteristics of the **cobas**® CT/NG v2.0 Test were evaluated in two multi-center clinical studies conducted in the United States. One clinical investigation used archived endocervical specimens, self-collected and clinician collected vaginal specimens, endocervical specimens in PreservCyt Solution and male and female urine specimens, from symptomatic and asymptomatic males and females, collected during the clinical evaluation of the **cobas**® CT/NG Test (archived samples). A second investigation was performed using prospectively collected endocervical specimens, clinician-collected vaginal specimens, female urine specimens, and cervical specimens in PreservCyt Solution from asymptomatic women (prospective fresh samples). Specimen collection for these studies took place at 18 collection sites in the US, which included family planning and Obstetrics/Gynecology (OB/GYN) clinics, and sexually transmitted disease clinics.

At collection sites, each female subject provided a urine specimen, a self-collected or clinician-collected vaginal swab specimen, a clinician-collected endocervical swab specimen, and a cervical specimen in PreservCyt® solution obtained with a spatula/cytobrush or a broom. For determination of Patient Infected Status (PIS) an aliquot of each urine, aliquots of each cervical specimen in PreservCyt solution, and an additional endocervical specimen, were collected in the appropriate transport media for two commercially available nucleic acid amplification tests (NAAT). For females, urine specimens were collected first. If a cervical cytology test was a scheduled part of the visit, that sample was taken next, followed by a vaginal and then endocervical swabs. If a cervical cytology test was not a scheduled part of the visit, a vaginal swab was taken next, followed by an endocervical swab and then the cervical specimen. The order of endocervical swab collection as well as clinician- or self-collection of the vaginal swabs was alternated to minimize collection bias.

Male subjects provided a urine specimen in **cobas**® PCR media and for the determination of PIS, urine and urethral swab specimens in collection media from two commercially available NAAT. For males, the urethral swabs were collected first in alternating order and then the urine specimen was collected.

5.2.2. Determination of Patient Infected Status

For each subject, a patient infected status (PIS) was determined based on the combined results from the reference assays. A subject was categorized as infected for CT or NG if a minimum of two positive results (at least one from each reference NAAT) was reported, as described in Table 20 and Table 22. For CT only, female subjects with positive results on both reference urine specimens and negative results on both reference endocervical swab specimens and the reference cervical sample were categorized as infected for urine and not infected for swab specimens. A subject was classified as non-infected if at least one of the reference NAATs reported negative results for all sample types. If patient infected status could not be determined due to missing and/or indeterminate results from the reference tests, the subject was excluded from the analysis. PIS was determined for all evaluable subjects enrolled in the study.

Table 20: Determination of Female Patient Infected Status

NAAT1 Urine/Endocervical	NAAT2 Urine/Endocervical	NAAT2 Cervical Specimen in PreservCyt	Patient Infected Status
+/+	+/+	+ or –	Infected
+/+	+/- or -/+	+ or -	Infected
+/- or -/+	+/+	+ or -	Infected
+/-	-/+	+ or -	Infected
-/+	+/-	+ or -	Infected
-/+	-/+	+ or -	Infected
+/-	+/-	+	Infected
+/-	+/-	-	CT: Infected (Urine) Non-Infected (Swabs) NG: Infected (Urine and Swabs)
+/- or -/+	-/-	+ or -	Non-Infected
+/+	-/-	+ or -	Non-Infected
-/-	+/+	+ or -	Non-Infected
-/-	+/- or -/+	+ or -	Non-Infected
-/-	-/-	+ or -	Non-Infected

Table 21: Determination of Male Patient Infected Status

NAAT 1 Urethral Swab/Urine	NAAT 2 Urethral Swab/Urine	Patient Infected Status (PIS)
+/+	+/+	Infected
+/+	+/- or -/+	Infected
+/- or -/+	+/+	Infected
+/-	-/+	Infected
-/+	+/-	Infected
-/+	-/+	Infected
+/-	+/-	Infected
+/- or -/+	-/-	Non-Infected
+/+	-/-	Non-Infected
-/-	+/+	Non-Infected
-/-	+/- or -/+	Non-Infected
-/-	-/-	Non-Infected

5.2.3. Study Results

Results from the **cobas**® CT/NG v2.0 Test were compared with the PIS for calculation of test sensitivity and specificity. Of the 6,045 subjects enrolled (5,306 females and 739 males), 10 were excluded from the analyses because they did not meet study entry criteria or because they withdrew consent; 31 were considered non-evaluable and were excluded from all statistical analyses because of errors in specimen collection, transport, and storage; unknown PIS for both CT and NG; or invalid **cobas**® CT/NG v2.0 Test results after initial testing and/or retesting. Therefore, of 6,035 eligible subjects enrolled, 6,004 (99.5%) were evaluable for CT and/or NG primary analyses (5,266 females and 738 males).

Results obtained from 1,011 prospective female asymptomatic subjects were analyzed combined with results obtained in the re-testing of all available samples (archived specimens) collected in the previous clinical study (4,255 females and 738 males).

In the clinical study, there was 1/385 (0.3%) invalid runs and 15/385 (3.9%) failed runs due to instrument error. Of the 26,283 specimens tested with the **cobas**® CT/NG v2.0 Test, 0.28% and 0.23% were initially invalid for CT and NG respectively and 1.38% initially had failed results for

both CT and NG. Following retesting up to two more times, 0.10% and 0.13% had final results of failed for both CT and NG. Table 22 through Table 29 summarize the data from the clinical specimen studies.

5.2.4. *Chlamydia trachomatis (CT)*

Sensitivity, specificity, and predictive values of the **cobas**® CT/NG v2.0 Test for CT as defined by PIS are presented by gender, sample type, and symptom status in Table 22. Overall Sensitivity ranged from 93.7% to 98.4%. The sensitivity for CT was 94.9%, 94.0%, 98.4%, 97.6%, 98.2%, 94.2%, and 93.7% for endocervical swabs, female urine specimens, male urine specimens, self-collected vaginal swabs, clinician-collected vaginal swabs, and PreservCyt specimens (pre- and post-ThinPrep processing), respectively. Overall specificity ranged from 98.8% to 99.8% in both females and males. Performance estimates for CT detection were similar between symptomatic and asymptomatic subjects.

Table 22: CT: Clinical Performance Compared With Patient Infected Status by Gender and Sample Type, and Symptom Status

Sample Type[a]	Symptom Status[b]	Total (n)	SENS	95% CI	SPEC	95% CI	PREV (%)	PPV (%)	NPV (%)
Female									
SW	Symp[c]	1932	94.7% (144/152)	(90.0%, 97.3%)	99.3% (1767/1780)	(98.8%, 99.6%)	7.9	91.7	99.5
	Asymp[d]	994	95.3% (81/85)	(88.5%, 98.2%)	99.6% (905/909)	(98.9%, 99.8%)	8.6	95.3	99.6
	Overall	2926	94.9% (225/237)	(91.4%, 97.1%)	99.4% (2672/2689)	(99.0%, 99.6%)	8.1	93.0	99.6
UR	Symp[c]	1937	94.4% (151/160)	(89.7%, 97.0%)	99.7% (1771/1777)	(99.3%, 99.8%)	8.3	96.2	99.5
	Asymp[d]	1008	93.3% (84/90)	(86.2%, 96.9%)	99.5% (913/918)	(98.7%, 99.8%)	8.9	94.4	99.3
	Overall	2945	94.0% (235/250)	(90.3%, 96.3%)	99.6% (2684/2695)	(99.3%, 99.8%)	8.5	95.5	99.4
VG-C	Symp[c]	899	96.2% (76/79)	(89.4%, 98.7%)	98.8% (810/820)	(97.8%, 99.3%)	8.8	88.4	99.6
	Asymp[d]	1003	100.0% (89/89)	(95.9%, 100.0%)	99.5% (909/914)	(98.7%, 99.8%)	8.9	94.7	100.0
	Overall	1902	98.2% (165/168)	(94.9%, 99.4%)	99.1% (1719/1734)	(98.6%, 99.5%)	8.8	91.7	99.8

Sample Type[a]	Symptom Status[b]	Total (n)	SENS	95% CI	SPEC	95% CI	PREV (%)	PPV (%)	NPV (%)
VG-S	Symp[c]	1041	98.7% (76/77)	(93.0%, 99.8%)	99.2% (956/964)	(98.4%, 99.6%)	7.4	90.5	99.9
	Asymp[c]	996	96.0% (48/50)	(86.5%, 98.9%)	99.4% (940/946)	(98.6%, 99.7%)	5.0	88.9	99.8
	Overall	2037	97.6% (124/127)	(93.3%, 99.2%)	99.3% (1896/1910)	(98.8%, 99.6%)	6.2	89.9	99.8
PC Pre	Symp[c]	1935	94.1% (143/152)	(89.1%, 96.9%)	99.7% (1778/1783)	(99.3%, 99.9%)	7.9	96.6	99.5
	Asymp[d]	1002	94.3% (83/88)	(87.4%, 97.5%)	99.8% (912/914)	(99.2%, 99.9%)	8.8	97.6	99.5
	Overall	2937	94.2% (226/240)	(90.4%, 96.5%)	99.7% (2690/2697)	(99.5%, 99.9%)	8.2	97.0	99.5
PC Post	Symp[c]	1871	93.9% (139/148)	(88.8%, 96.8%)	99.5% (1715/1723)	(99.1%, 99.8%)	7.9	94.6	99.5
	Asymp[d]	1007	93.3% (83/89)	(86.1%, 96.9%)	99.5% (913/918)	(98.7%, 99.8%)	8.8	94.3	99.3
	Overall	2878	93.7% (222/237)	(89.8%, 96.1%)	99.5% (2628/2641)	(99.2%, 99.7%)	8.2	94.5	99.4
Male									
UR	Symp[c]	278	98.6% (69/70)	(92.3%, 99.7%)	99.0% (206/208)	(96.6%, 99.7%)	25.2	97.2	99.5
	Asymp[c]	460	98.1% (51/52)	(89.9%, 99.7%)	99.3% (405/408)	(97.9%, 99.7%)	11.3	94.4	99.8
	Overall	738	98.4% (120/122)	(94.2%, 99.5%)	99.2% (611/616)	(98.1%, 99.7%)	16.5	96.0	99.7

[a] SW = endocervical swab, UR = urine, VG-C = clinician-collected vaginal swab, VG-S = self-collected vaginal swab, PC Pre = PreservCyt (pre-aliquot), PC Post = PreservCyt (post-aliquot).

b Symp = symptomatic, Asymp = asymptomatic.

[c] **cobas®** CT/NG v2.0 Test results from archived specimens.

[d] **cobas®** CT/NG v2.0 Test results from prospectively collected specimens.

Note: Subjects are designated as being infected with CT if at least 2 NAATs with different target regions give positive results in the endocervical swab (urethral swab for males) and/or the urine specimen. However, females are categorized as non-infected for any swab specimen if the swab specimens and the PreservCyt specimen (NAAT2) were negative and the urine specimens were positive.

Note: Subjects with designated infection status and valid **cobas®** CT/NG v2.0 Test results are considered evaluable and included in this summary table.

Note: CI = (score) confidence interval, PREV = prevalence, SENS = sensitivity, SPEC = specificity, PPV = positive predictive value, NPV = negative predictive value.

For archived specimens from female asymptomatic patients, sensitivity for CT was 91.2% (93/102), 92.9% (104/112), 94.4% (51/54), 88.6% (93/105), and 87.5% (91/104), respectively for endocervical swabs, female urine specimens, clinician-collected vaginal swabs, and PreservCyt specimens (pre- and post-ThinPrep processing), with specificity for CT of 99.9% (2,076/2,078), 99.8% (2,065/2,070), 99.9% (1,183/1,184), 99.6% (2,085/2,094), and 99.7% (1,881/1,886) respectively for these sample types.

Table 23 and Table 24 summarize the results from symptomatic and asymptomatic subjects designated as infected or non-infected with CT (females and males, respectively) according to the PIS algorithm. A total of 365 females and 122 males were infected with CT. Symptoms were reported in 44.4% (162/365) of infected and 37.0% (1,814/4,900) of non-infected women. Similarly, symptoms were reported in 57.4% (70/122) of infected and 33.8% (208/616) of non-infected men. Overall, the CT prevalence was 6.9% (365/5,265), 16.5% (122/738), and 8.1% (487/6,003) in women, men, and the entire study population, respectively.

Table 23: CT, Positive/Negative Analysis for Female Patient Infected Status

Patient Infected Status	NAAT1[a]		NAAT2[a]			cobas CT/NG v2.0 Test					Symptom Status[b]		Total
	SW	UR	SW	UR	PC Pre	SW	UR	VG	PC Pre	PC Post	Symp	Asymp	
Infected	+	+	+	+	+	+	+	+	+	+	113	144	257
Infected	+	+	+	+	+	NA	+	+	+	+	3	7	10
Infected	+	-	+	-	+	+	-	+	+	+	3	2	5
Infected	-	+	-	+	-	-	+	-	-	-	2	3	5
Infected	+	+	+	+	+	+	+	+	+	NA	3	1	4
Infected	+	+	+	-	+	+	+	+	+	+	2	2	4
Infected	+	-	+	+	+	+	+	+	+	+	4	0	4
Infected	+	+	+	+	+	+	+	+	-	+	2	1	3
Infected	+	-	+	+	+	+	-	+	+	+	1	2	3
Infected	+	+	+	+	+	+	+	+	-	-	1	1	2
Infected	+	+	+	+	+	+	+	+	NA	NA	1	1	2
Infected	+	+	+	+	+	+	-	+	+	+	1	1	2
Infected	+	+	+	+	+	NA	+	NA	+	+	0	2	2
Infected	+	+	+	+	NA	+	+	+	NA	NA	1	1	2
Infected	+	-	+	-	-	+	-	-	-	-	0	2	2
Infected	-	+	+	+	+	+	+	+	+	+	0	2	2
Infected	-	+	+	+	+	-	+	+	-	-	1	1	2
Infected	-	+	+	+	-	-	+	+	-	-	2	0	2
Infected	-	+	-	+	-	-	+	+	-	-	1	1	2
Infected	+	+	+	+	+	+	+	+	NA	+	0	1	1
Infected	+	+	+	+	+	+	+	NA	+	+	1	0	1
Infected	+	+	+	+	+	+	-	+	+	-	0	1	1
Infected	+	+	+	+	+	+	NA	+	+	+	1	0	1
Infected	+	+	+	+	+	-	+	+	+	+	1	0	1
Infected	+	+	+	+	+	-	+	+	+	-	0	1	1
Infected	+	+	+	+	+	-	+	+	-	-	0	1	1
Infected	+	+	+	+	-	+	+	+	-	+	0	1	1
Infected	+	+	+	+	NA	NA	+	+	NA	NA	1	0	1
Infected	+	+	-	+	+	+	+	+	+	+	0	1	1
Infected	+	+	-	+	+	-	+	+	+	+	1	0	1

Patient Infected Status	NAAT1[a]		NAAT2[a]			cobas CT/NG v2.0 Test					Symptom Status[b]		Total
	SW	UR	SW	UR	PC Pre	SW	UR	VG	PC Pre	PC Post	Symp	Asymp	
Infected	+	+	-	+	+	-	+	+	+	-	0	1	1
Infected	+	+	-	+	+	-	+	+	-	-	0	1	1
Infected	+	+	-	+	-	+	+	+	+	NA	1	0	1
Infected	+	+	NA	+	NA	NA	NA	NA	NA	+	0	1	1
Infected	+	+	+	-	+	+	+	+	NA	+	1	0	1
Infected	+	+	+	-	+	+	+	-	+	+	0	1	1
Infected	+	+	+	-	+	+	-	+	+	+	0	1	1
Infected	+	+	+	-	+	-	+	+	-	-	0	1	1
Infected	+	+	+	-	+	NA	+	+	+	+	0	1	1
Infected	+	+	+	-	-	+	+	+	-	-	0	1	1
Infected	+	+	+	-	-	-	+	NA	-	NA	0	1	1
Infected	+	+	+	NA	+	+	+	+	+	+	1	0	1
Infected	+	-	+	+	+	+	+	+	+	-	0	1	1
Infected	+	-	+	+	+	+	+	+	+	NA	1	0	1
Infected	+	-	+	+	+	+	+	-	+	+	0	1	1
Infected	+	-	+	+	+	+	-	-	+	+	1	0	1
Infected	+	-	+	+	+	NA	+	+	+	-	1	0	1
Infected	+	-	+	-	+	+	+	+	+	+	0	1	1
Infected	+	-	+	-	+	+	-	+	+	-	0	1	1
Infected	+	-	+	-	+	+	-	-	+	+	1	0	1
Infected	+	-	+	-	+	-	-	+	-	-	0	1	1
Infected	+	-	+	-	-	+	-	+	+	+	0	1	1
Infected	+	-	+	-	-	-	-	NA	-	-	0	1	1
Infected	+	-	+	-	NA	+	+	+	-	-	0	1	1
Infected	+	-	+	NA	+	+	-	-	-	-	1	0	1
Infected	+	NA	+	NA	+	+	NA	+	NA	NA	1	0	1
Infected	-	+	+	+	+	+	+	+	-	+	1	0	1
Infected	-	+	+	+	+	-	+	+	+	+	1	0	1
Infected	-	+	+	+	+	-	+	+	-	+	0	1	1
Infected	-	+	+	+	+	-	+	-	-	-	1	0	1
Infected	-	+	+	+	-	-	+	+	+	-	0	1	1
Infected	-	+	+	+	-	-	-	+	+	-	1	0	1
Infected	-	+	-	+	+	+	+	+	+	-	1	0	1
Infected	-	+	-	+	-	+	+	+	-	+	0	1	1
Infected	-	+	-	+	-	-	+	+	+	+	1	0	1
Infected	-	+	-	+	-	-	+	+	-	+	1	0	1
Infected	-	+	-	+	NA	-	+	-	NA	NA	0	1	1
Infected	-	+	NA	+	-	+	+	+	-	-	0	1	1
Infected	-	+	+	-	-	-	-	+	-	-	0	1	1
Total Infected											**162**	**203**	**365**

Patient Infected Status	NAAT1[a]		NAAT2[a]			cobas CT/NG v2.0 Test					Symptom Status[b]		Total
	SW	UR	SW	UR	PC Pre	SW	UR	VG	PC Pre	PC Post	Symp	Asymp	
Non-Infected	-	-	-	-	-	-	-	-	-	-	1575	2561	4136
Non-Infected	-	-	-	-	-	-	-	-	-	NA	57	178	235
Non-Infected	-	-	-	-	-	NA	-	-	-	-	27	30	57
Non-Infected	-	-	-	-	-	-	-	NA	-	-	26	27	53
Non-Infected	-	-	-	-	-	-	NA	-	-	-	23	26	49
Non-Infected	-	-	-	-	NA	-	-	-	NA	NA	17	28	45
Non-Infected	-	-	-	-	-	-	NA	-	-	NA	3	37	40
Non-Infected	-	-	-	-	-	-	-	-	NA	-	5	32	37
Non-Infected	-	-	-	-	-	-	-	-	NA	NA	10	18	28
Non-Infected	-	-	-	-	-	NA	NA	-	-	-	1	18	19
Non-Infected	NA	NA	-	-	-	NA	-	-	-	-	0	16	16
Non-Infected	-	-	-	-	-	NA	-	NA	-	-	2	13	15
Non-Infected	-	-	+	-	-	-	-	-	-	-	8	6	14
Non-Infected	-	-	-	-	-	NA	-	-	-	NA	1	12	13
Non-Infected	-	-	-	-	-	-	-	+	-	-	7	5	12
Non-Infected	-	-	-	-	-	-	+	-	-	-	4	7	11
Non-Infected	-	-	-	-	-	NA	NA	-	-	NA	1	9	10
Non-Infected	NA	-	-	-	-	-	-	-	-	-	3	7	10
Non-Infected	-	-	-	-	-	+	-	-	-	-	7	2	9
Non-Infected	+	-	-	-	-	-	-	-	-	-	2	5	7
Non-Infected	-	-	-	+	-	-	-	-	-	-	4	3	7
Non-Infected	-	-	-	-	-	-	-	-	-	+	1	6	7
Non-Infected	-	-	-	-	+	-	-	-	-	-	1	5	6
Non-Infected	-	-	-	-	-	NA	NA	NA	-	-	3	3	6
Non-Infected	-	-	-	-	-	-	-	-	+	-	2	3	5
Non-Infected	-	+	-	-	-	-	-	-	-	-	0	4	4
Non-Infected	-	-	-	-	-	-	NA	-	NA	NA	1	2	3
Non-Infected	-	-	-	NA	-	-	-	-	-	-	2	1	3
Non-Infected	-	-	-	-	+	-	-	-	+	-	0	2	2
Non-Infected	-	-	NA	-	-	-	-	-	-	-	0	2	2
Non-Infected	-	NA	-	-	-	-	-	-	-	-	1	1	2
Non-Infected	NA	NA	-	-	-	NA	-	-	NA	-	0	2	2
Non-Infected	+	+	-	-	-	+	-	+	-	+	1	0	1
Non-Infected	+	-	-	-	+	+	-	+	+	+	1	0	1
Non-Infected	+	-	-	-	+	-	-	+	+	+	1	0	1
Non-Infected	+	-	-	-	-	+	-	+	-	-	0	1	1
Non-Infected	+	-	-	-	-	+	-	-	-	-	1	0	1
Non-Infected	-	+	-	-	-	-	NA	-	-	-	1	0	1
Non-Infected	-	-	+	+	+	+	+	+	+	+	0	1	1
Non-Infected	-	-	+	+	-	+	+	+	-	-	1	0	1
Non-Infected	-	-	+	+	-	-	-	+	-	-	1	0	1
Non-Infected	-	-	+	+	-	-	-	-	+	-	0	1	1
Non-Infected	-	-	-	+	+	-	+	+	+	-	0	1	1
Non-Infected	-	-	-	+	-	-	+	-	-	-	1	0	1

Patient Infected Status	NAAT1[a]		NAAT2[a]			cobas CT/NG v2.0 Test					Symptom Status[b]		Total
	SW	UR	SW	UR	PC Pre	SW	UR	VG	PC Pre	PC Post	Symp	Asymp	
Non-Infected	-	-	+	-	+	-	-	+	+	+	0	1	1
Non-Infected	-	-	+	-	-	-	-	+	-	-	1	0	1
Non-Infected	-	-	+	-	-	-	-	-	-	+	1	0	1
Non-Infected	-	-	+	-	-	-	NA	NA	-	-	1	0	1
Non-Infected	-	-	-	-	+	+	-	-	-	+	1	0	1
Non-Infected	-	-	-	-	+	-	-	-	-	NA	0	1	1
Non-Infected	-	-	-	-	+	-	-	NA	-	-	0	1	1
Non-Infected	-	-	-	-	-	+	+	-	-	-	0	1	1
Non-Infected	-	-	-	-	-	+	-	+	-	-	1	0	1
Non-Infected	-	-	-	-	-	-	-	+	+	-	0	1	1
Non-Infected	-	-	-	-	-	-	-	+	-	NA	1	0	1
Non-Infected	-	-	-	-	-	-	-	NA	-	+	0	1	1
Non-Infected	-	-	-	-	-	-	-	NA	-	NA	0	1	1
Non-Infected	-	-	-	-	-	-	NA	-	+	NA	0	1	1
Non-Infected	-	-	-	-	-	-	NA	NA	-	-	0	1	1
Non-Infected	-	-	-	-	-	NA	-	NA	NA	NA	1	0	1
Non-Infected	-	-	-	-	-	NA	NA	-	NA	-	0	1	1
Non-Infected	-	-	-	-	-	NA	NA	-	NA	NA	1	0	1
Non-Infected	-	-	-	-	-	NA	NA	NA	-	NA	1	0	1
Non-Infected	-	-	NA	-	NA	-	-	-	NA	NA	1	0	1
Non-Infected	-	-	-	NA	NA	NA	NA	NA	-	-	1	0	1
Non-Infected	-	NA	-	-	-	-	-	-	-	NA	1	0	1
Non-Infected	NA	NA	-	-	-	-	-	-	-	-	0	1	1
Total Non-Infected											**1814**	**3086**	**4900**

[a] NAAT1 and NAAT2 = Commercially available CT/NG NAAT assays.

[b] Symp = symptomatic, Asymp = asymptomatic.

Note: Subjects are designated as being infected with CT if at least 2 predicate NAATs with different target regions give positive results in the endocervical swab and/or the urine specimen. However, females are categorized as non-infected for any swab specimen if the swab specimens and the PreservCyt specimen (NAAT2) were negative and the urine specimens were positive.

Note: Subjects with designated infection status and valid **cobas®** CT/NG v2.0 Test results are considered evaluable and included in this summary table.

Note: + denotes Positive; - denotes Negative; NA indicates specimen was not obtained or available for testing.

Note: SW = endocervical swab, UR = urine, VG = vaginal swab, PC Pre = PreservCyt (pre-aliquot), PC Post = PreservCyt (post-aliquot).

Table 24: CT, Positive/Negative Analysis for Male Patient Infected Status

Patient Infected Status	NAAT1[a]		NAAT2[a]		cobas CT/NG v2.0 Test	Symptom Status[b]		Total
	SW	UR	SW	UR	UR	Symp	Asymp	
Infected	+	+	+	+	+	64	43	107
Infected	-	+	-	+	+	3	3	6
Infected	-	+	+	+	+	0	3	3
Infected	+	+	+	-	+	1	1	2
Infected	+	-	+	-	-	0	1	1
Infected	+	-	+	+	+	0	1	1
Infected	-	+	+	-	+	1	0	1
Infected	-	+	-	+	-	1	0	1
Total Infected						**70**	**52**	**122**
Non-Infected	-	-	-	-	-	203	399	602
Non-Infected	-	-	-	-	+	1	2	3
Non-Infected	-	-	+	-	-	1	1	2
Non-Infected	-	-	-	+	-	1	1	2
Non-Infected	-	-	+	+	-	0	2	2
Non-Infected	-	+	-	-	-	0	2	2
Non-Infected	-	-	+	+	+	0	1	1
Non-Infected	+	-	-	-	-	1	0	1
Non-Infected	+	+	-	-	+	1	0	1
Total Non-Infected						**208**	**408**	**616**

[a] NAAT1 and NAAT2 = Commercially available CT/NG NAAT assays.

[b] Symp = symptomatic, Asymp = asymptomatic.

Note: Subjects are designated as being infected with CT if at least 2 predicate NAATs with different target regions give positive results in the urethral swab and/or the urine specimen.

Note: Subjects with designated infection status and valid **cobas®** CT/NG v2.0 Test results are considered evaluable and included in this summary table.

Note: + denotes Positive; - denotes Negative.

Note: SW = urethral swab, UR= urine.

5.2.5. Neisseria gonorrhoeae (NG)

Sensitivity, specificity, and predictive values of the **cobas®** CT/NG v2.0 Test for NG as defined by PIS are shown by gender, sample type, and symptom status in Table 25. Overall sensitivity ranged from 95.6% to 100.0%. Overall specificity ranged from 99.1% to 100.0% for both females and males. Performance estimates for NG detection were similar between symptomatic and asymptomatic subjects.

Table 25: NG: Clinical Performance Compared With Patient Infected Status by Gender, Sample Type, and Symptom Status

Sample Type[a]	Symptom Status[b]	Total (n)	SENS	95% CI	SPEC	95% CI	PREV (%)	PPV (%)	NPV (%)
Female									
SW	Symp[c]	1930	95.2% (40/42)	(84.2%, 98.7%)	99.9% (1886/1888)	(99.6%, 100.0%)	2.2	95.2	99.9
	Asymp[d]	3174	97.9% (46/47)	(88.9%, 99.6%)	99.9% (3124/3127)	(99.7%, 100.0%)	1.5	93.9	100.0
	Overall	5104	96.6% (86/89)	(90.6%, 98.8%)	99.9% (5010/5015)	(99.8%, 100.0%)	1.7	94.5	99.9
UR	Symp[c]	1937	90.5% (38/42)	(77.9%, 96.2%)	99.7% (1890/1895)	(99.4%, 99.9%)	2.2	88.4	99.8
	Asymp[d]	3190	100.0% (48/48)	(92.6%, 100.0%)	99.6% (3130/3142)	(99.3%, 99.8%)	1.5	80.0	100.0
	Overall	5127	95.6% (86/90)	(89.1%, 98.3%)	99.7% (5020/5037)	(99.5%, 99.8%)	1.8	83.5	99.9
VG-C	Symp[c]	898	100.0% (21/21)	(84.5%, 100.0%)	99.7% (874/877)	(99.0%, 99.9%)	2.3	87.5	100.0
	Asymp[d]	2240	100.0% (37/37)	(90.6%, 100.0%)	99.7% (2197/2203)	(99.4%, 99.9%)	1.7	86.0	100.0
	Overall	3138	100.0% (58/58)	(93.8%, 100.0%)	99.7% (3071/3080)	(99.4%, 99.8%)	1.8	86.6	100.0
VG-S	Symp[c]	1041	95.2% (20/21)	(77.3%, 99.2%)	100.0% (1020/1020)	(99.6%, 100.0%)	2.0	100.0	99.9
	Asymp[c]	996	100.0% (9/9)	(70.1%, 100.0%)	100.0% (987/987)	(99.6%, 100.0%)	0.9	100.0	100.0
	Overall	2037	96.7% (29/30)	(83.3%, 99.4%)	100.0% (2007/2007)	(99.8%, 100.0%)	1.5	100.0	100.0
PC Pre	Symp[c]	1935	100.0% (43/43)	(91.8%, 100.0%)	99.9% (1890/1892)	(99.6%, 100.0%)	2.2	95.6	100.0
	Asymp[d]	3196	93.9% (46/49)	(83.5%, 97.9%)	99.8% (3142/3147)	(99.6%, 99.9%)	1.5	90.2	99.9
	Overall	5131	96.7% (89/92)	(90.8%, 98.9%)	99.9% (5032/5039)	(99.7%, 99.9%)	1.8	92.7	99.9
PC Post	Symp[c]	1872	95.3% (41/43)	(84.5%, 98.7%)	99.8% (1825/1829)	(99.4%, 99.9%)	2.3	91.1	99.9
	Asymp[d]	2996	95.8% (46/48)	(86.0%, 98.8%)	99.7% (2940/2948)	(99.5%, 99.9%)	1.6	85.2	99.9
	Overall	4868	95.6% (87/91)	(89.2%, 98.3%)	99.7% (4765/4777)	(99.6%, 99.9%)	1.9	87.9	99.9

Sample Type[a]	Symptom Status[b]	Total (n)	SENS	95% CI	SPEC	95% CI	PREV (%)	PPV (%)	NPV (%)
Male									
UR	Symp[c]	278	100.0% (60/60)	(94.0%, 100.0%)	99.1% (216/218)	(96.7%, 99.7%)	21.6	96.8	100.0
	Asymp[c]	460	100.0% (7/7)	(64.6%, 100.0%)	99.3% (450/453)	(98.1%, 99.8%)	1.5	70.0	100.0
	Overall	738	100.0% (67/67)	(94.6%, 100.0%)	99.3% (666/671)	(98.3%, 99.7%)	9.1	93.1	100.0

[a] SW = endocervical swab, UR = urine, VG-C = clinician-collected vaginal swab, VG-S = self-collected vaginal swab, PC Pre = PreservCyt (pre-aliquot), PC Post = PreservCyt (post-aliquot).

[b] Symp = symptomatic, Asymp = asymptomatic.

[c] **cobas®** CT/NG v2.0 Test results from archived specimens.

[d] **cobas®** CT/NG v2.0 Test results from archived and prospectively collected specimens.

Note: Subjects are designated as being infected with NG if at least 2 predicate NAATs with different target regions give positive results in the endocervical swab (urethral swab for males) and/or the urine specimen

Note: Subjects with designated infection status and valid cobas CT/NG v2.0 Test results are considered evaluable and included in this summary table.

Note: CI = (score) confidence interval, PREV = prevalence, SENS = sensitivity, SPEC = specificity, PPV = positive predictive value, NPV = negative predictive value.

Table 26 and Table 27 summarize the results from symptomatic and asymptomatic subjects designated as infected or non-infected with NG (females and males, respectively) according to the PIS algorithm.

A total of 92 females and 67 males were infected with NG. Symptoms were reported in 46.7% (43/92) of infected and 37.4% (1,932/5,171) of non-infected women. Similarly, symptoms were reported in 89.6% (60/67) of infected and 32.5% (218/671) of non-infected men. Overall, the NG prevalence was 1.7% (92/5,263), 9.1% (67/738), and 2.6% (159/6,001), respectively, in women, men, and the entire study population.

Table 26: NG, Positive/Negative Analysis for Female Patient Infected Status

Patient Infected Status	NAAT1[a]		NAAT2[a]			cobas CT/NG v2.0 Test					Symptom Status[b]		Total
	SW	UR	SW	UR	PC Pre	SW	UR	VG	PC Pre	PC Post	Symp	Asymp	
Infected	+	+	+	+	+	+	+	+	+	+	29	37	66
Infected	+	+	+	+	+	+	+	NA	+	+	1	2	3
Infected	+	+	+	-	+	+	+	+	+	+	1	2	3
Infected	+	-	+	-	+	+	-	+	+	+	3	0	3
Infected	+	+	+	+	+	NA	+	+	+	+	1	1	2
Infected	+	+	+	+	-	+	+	+	+	+	0	2	2
Infected	+	+	+	+	+	+	+	+	+	-	1	0	1
Infected	+	+	+	+	+	+	+	+	-	-	0	1	1
Infected	+	+	+	+	+	+	+	-	+	+	1	0	1
Infected	+	+	+	+	+	+	-	+	+	+	1	0	1
Infected	+	+	+	+	+	+	NA	+	+	+	1	0	1
Infected	+	+	+	+	+	NA	NA	NA	+	+	0	1	1
Infected	+	+	+	+	-	-	+	+	+	-	1	0	1
Infected	+	-	+	-	+	+	+	+	+	+	1	0	1
Infected	+	-	+	-	-	+	+	+	+	+	1	0	1
Infected	-	+	+	+	+	+	+	+	+	+	0	1	1
Infected	-	+	+	+	+	+	+	+	-	NA	0	1	1
Infected	-	+	+	+	+	-	+	+	+	+	1	0	1
Infected	-	+	+	+	+	-	+	+	-	-	0	1	1
Total Infected											**43**	**49**	**92**
Non-Infected	-	-	-	-	-	-	-	-	-	-	1704	2709	4413
Non-Infected	-	-	-	-	-	-	-	-	-	NA	62	177	239
Non-Infected	-	-	-	-	-	NA	-	-	-	-	30	36	66
Non-Infected	-	-	-	-	-	-	-	NA	-	-	26	29	55
Non-Infected	-	-	-	-	-	-	NA	-	-	-	24	25	49
Non-Infected	-	-	-	-	NA	-	-	-	NA	NA	18	30	48
Non-Infected	-	-	-	-	-	-	-	-	NA	-	7	37	44
Non-Infected	-	-	-	-	-	-	NA	-	-	NA	3	38	41
Non-Infected	-	-	-	-	-	-	-	-	NA	NA	10	19	29
Non-Infected	-	-	-	-	-	NA	NA	-	-	-	1	18	19
Non-Infected	-	-	-	-	-	NA	-	NA	-	-	2	15	17
Non-Infected	NA	NA	-	-	-	NA	-	-	-	-	0	16	16
Non-Infected	-	-	-	-	-	-	+	-	-	-	5	9	14
Non-Infected	-	-	-	-	-	NA	-	-	-	NA	1	12	13
Non-Infected	+	-	-	-	-	-	-	-	-	-	5	6	11
Non-Infected	-	-	-	-	-	NA	NA	-	-	NA	1	9	10
Non-Infected	NA	-	-	-	-	-	-	-	-	-	3	7	10
Non-Infected	-	+	-	-	-	-	-	-	-	-	0	9	9
Non-Infected	-	-	-	-	-	-	-	-	-	+	3	4	7
Non-Infected	-	-	-	-	-	NA	NA	NA	-	-	3	2	5
Non-Infected	-	-	-	+	-	-	-	-	-	-	2	2	4

Patient Infected Status	NAAT1[a]		NAAT2[a]			cobas CT/NG v2.0 Test					Symptom Status[b]		Total
	SW	UR	SW	UR	PC Pre	SW	UR	VG	PC Pre	PC Post	Symp	Asymp	
Non-Infected	-	-	-	-	-	-	-	+	-	-	2	2	4
Non-Infected	-	-	NA	-	-	-	-	-	-	-	2	2	4
Non-Infected	-	-	-	-	+	-	-	-	-	-	1	2	3
Non-Infected	-	-	-	-	-	-	-	-	+	-	1	2	3
Non-Infected	-	-	-	-	-	-	NA	-	NA	NA	1	2	3
Non-Infected	-	-	-	NA	-	-	-	-	-	-	2	1	3
Non-Infected	-	-	+	-	-	-	-	-	-	-	1	1	2
Non-Infected	-	-	-	-	-	-	-	+	-	+	0	2	2
Non-Infected	-	-	-	-	-	-	-	NA	-	NA	0	2	2
Non-Infected	-	-	-	-	-	-	NA	NA	-	-	1	1	2
Non-Infected	-	NA	-	-	-	-	-	-	-	-	1	1	2
Non-Infected	NA	NA	-	-	-	NA	-	-	NA	-	0	2	2
Non-Infected	+	+	-	-	+	+	+	+	+	+	0	1	1
Non-Infected	+	+	-	-	+	NA	+	+	+	+	0	1	1
Non-Infected	+	+	-	-	-	-	-	-	-	-	0	1	1
Non-Infected	+	-	-	-	-	+	NA	-	-	-	0	1	1
Non-Infected	-	+	-	-	-	-	-	-	-	NA	0	1	1
Non-Infected	-	-	-	-	+	-	-	-	+	-	0	1	1
Non-Infected	-	-	-	-	-	+	-	-	-	-	1	0	1
Non-Infected	-	-	-	-	-	+	-	-	-	NA	0	1	1
Non-Infected	-	-	-	-	-	+	-	-	NA	NA	1	0	1
Non-Infected	-	-	-	-	-	-	+	-	NA	-	0	1	1
Non-Infected	-	-	-	-	-	-	-	+	-	NA	1	0	1
Non-Infected	-	-	-	-	-	NA	-	-	+	+	1	0	1
Non-Infected	-	-	-	-	-	NA	-	NA	NA	NA	1	0	1
Non-Infected	-	-	-	-	-	NA	NA	-	NA	-	0	1	1
Non-Infected	-	-	-	-	-	NA	NA	-	NA	NA	1	0	1
Non-Infected	-	-	-	-	-	NA	NA	NA	-	NA	1	0	1
Non-Infected	-	-	-	-	NA	NA	-	-	NA	NA	1	0	1
Non-Infected	-	-	-	NA	NA	NA	NA	NA	-	-	1	0	1
Non-Infected	-	NA	-	-	-	-	-	-	-	NA	1	0	1
Non-Infected	NA	NA	-	-	-	-	-	-	-	-	0	1	1
Total Non-Infected											**1932**	**3239**	**5171**

[a] NAAT1 and NAAT2 = Commercially available CT/NG NAAT assays.

[b] Symp = symptomatic, Asymp = asymptomatic.

Note: Subjects are designated as being infected with NG if at least 2 predicate NAATs with different target regions give positive results in the endocervical swab and/or the urine specimen.

Note: Subjects with designated infection status and valid **cobas®** CT/NG v2.0 Test results are considered evaluable and included in this summary table.

Note: + denotes Positive; - denotes Negative; NA indicates specimen was not obtained or available for testing.

Note: SW = endocervical swab, UR = urine, VG = vaginal swab, PC Pre = PreservCyt (pre-aliquot), PC Post = PreservCyt (post-aliquot).

Table 27: NG, Positive/Negative Analysis for Male Patient Infected Status

Patient Infected Status	NAAT1[a]		NAAT2[a]		cobas CT/NG 2.0 Test	Symptom Status[b]		Total
	SW	UR	SW	UR	UR	Symp	Asymp	
Infected	+	+	+	+	+	59	7	66
Infected	+	+	-	+	+	1	0	1
Total Infected						**60**	**7**	**67**
Non-Infected	-	-	-	-	-	213	449	662
Non-Infected	-	-	-	-	+	2	3	5
Non-Infected	-	+	-	-	-	1	1	2
Non-Infected	-	-	+	-	-	1	0	1
Non-Infected	+	-	-	-	-	1	0	1
Total Non-Infected						**218**	**453**	**671**

[a] NAAT1 and NAAT2 = Commercially available CT/NG NAAT assays.

[b] Symp = symptomatic, Asymp = asymptomatic.

Note: Subjects are designated as being infected with NG if at least 2 predicate NAATs with different target regions give positive results in the urethral swab and/or the urine specimen.

Note: Subjects with designated infection status and valid **cobas**® CT/NG v2.0 Test results are considered evaluable and included in this summary table.

Note: + denotes Positive; - denotes Negative.

Note: SW = urethral swab, UR= urine.

5.2.6. Prevalence

The prevalence of CT and NG in patient populations depends upon a variety of factors including age, gender, the presence of symptoms, clinic type, and test method. The prevalence of CT observed with the **cobas**® CT/NG v2.0 Test during a multi-center clinical trial ranged from 5.0% to 8.9% in females , and from 11.3% to 25.2% in males (Table 22); the prevalence of NG ranged from 0.9% to 2.3% in females, and from 1.5% to 21.6% in males (Table 25).

5.2.7. Positive and Negative Predictive Value

Hypothetical positive and negative predictive values (PPV & NPV) derived from disease prevalence of 1 to 50% for the **cobas**® CT/NG v2.0 Test are shown in Table 28 and Table 29. The overall sensitivity and specificity (compared with PIS) were 94.1% and 99.6%, respectively, for CT; and 97.1% and 99.8%, respectively, for NG.

Table 28: Positive Predictive Value and Negative Predictive Value for Hypothetical CT Prevalence

Prevalence (%)	Sensitivity* (%)	Specificity* (%)	PPV (%)	NPV (%)
1	94.1	99.6	69.0	99.9
3	94.1	99.6	87.2	99.8
5	94.1	99.6	92.0	99.7
10	94.1	99.6	96.1	99.3
15	94.1	99.6	97.5	99.0
20	94.1	99.6	98.2	98.5
30	94.1	99.6	98.9	97.5
50	94.1	99.6	99.5	94.4

* Overall sensitivity and specificity were estimated by comparing the **cobas**® CT/NG v2.0 Test results to patient infected status across all sample types in both female and male subjects.

Note: PPV = positive predictive value; NPV = negative predictive value.

Table 29: Positive Predictive Value and Negative Predictive Value for Hypothetical NG Prevalence

Prevalence (%)	Sensitivity* (%)	Specificity* (%)	PPV (%)	NPV (%)
1	97.1	99.8	82.0	100.0
3	97.1	99.8	93.3	99.9
5	97.1	99.8	96.0	99.8
10	97.1	99.8	98.0	99.7
15	97.1	99.8	98.8	99.5
20	97.1	99.8	99.1	99.3
30	97.1	99.8	99.5	98.8
50	97.1	99.8	99.8	97.2

* Overall sensitivity and specificity were estimated by comparing the **cobas**® CT/NG v2.0 Test results to patient infected status across all sample types in both female and male subjects.

Note: PPV = positive predictive value; NPV = negative predictive value.

6. CONCLUSION

A comparison of the intended use, technological characteristics, and the results of non-clinical analytical and clinical performance studies demonstrate that the **cobas**® CT/NG v2.0 Test is substantially equivalent to the predicate device.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

December 2, 2013

ROCHE MOLECULAR SYSTEMS, INC.
C/O DR. WILK VON GUSTEDT
4300 HACIENDA DRIVE
PLEASANTON CA 94588-2722

Re: K132270
Trade/Device Name: **cobas®** CT/NG v2.0 Test
Regulation Number: 21 CFR 866.3390
Regulation Name: Neisseria spp. direct serological test reagents
Regulatory Class: II
Product Code: LSL, MKZ, OOI
Dated: November 8, 2013
Received: November 12, 2013

Dear Dr. von Gustedt:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulations (21 CFR Parts 801 and 809), please contact the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638 2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Sally A. Hojvat -S

Sally Hojvat, M.Sc., Ph.D.
Director
Division of Microbiology Devices
Office of In Vitro Diagnostics
and Radiological Health
Center for Devices and Radiological Health

Enclosure

INDICATIONS FOR USE

510(k) Number: k132270

Device Name: Roche **cobas**® CT/NG v2.0 Test

Indications For Use: The **cobas**® CT/NG v2.0 Test is an automated, in vitro nucleic acid amplification test for the qualitative detection of *Chlamydia trachomatis* (CT) and/or *Neisseria gonorrhoeae* (NG) DNA in urogenital specimens. The Test utilizes the Polymerase Chain Reaction (PCR) for the detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* DNA in male and female urine, self-collected vaginal swab specimens (collected in a clinical setting), clinician-collected vaginal swab specimens, and endocervical swab specimens, all collected in **cobas**® PCR Media (Roche Molecular Systems, Inc.), and cervical specimens collected in PreservCyt® solution. This test is intended as an aid in the diagnosis of chlamydial and gonococcal disease in both symptomatic and asymptomatic individuals.

Ancillary Collection Kits

The **cobas**® PCR Female Swab Sample Kit is used to collect and transport endocervical and vaginal swab specimens. The **cobas**® PCR Media serves as a nucleic acid stabilizing transport and storage medium for gynecological specimens. Use this collection kit only with either the **cobas**® CT/NG Test or the **cobas**® CT/NG v2.0 Test.

The **cobas**® PCR Urine Sample Kit is used to collect and transport urine specimens. The **cobas**® PCR Media serves as a nucleic acid stabilizing transport and storage medium for urine specimens. Use this collection kit only with either the **cobas**® CT/NG Test or the **cobas**® CT/NG v2.0 Test.

Prescription Use___X___ **AND/OR** **Over-The-Counter Use**_____
(Part 21 CFR 801 Subpart D) **(Part 21 CFR 801 Subpart C)**

(PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of Center for Devices and Radiological Health (CDRH)

Tamara V. Feldblyum -S
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